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ABSTRACT

This study investigates environmental knowledge, attitudes, and behavior among adult Americans. Public attitudes as they exist today and how they have changed over the past seven years are evaluated. A nationally representative sample of 2,000 Americans aged 18 and older were surveyed by Roper Starch Worldwide in May, 1998. Part 1 presents environmental knowledge and environmental myths. Part 2 discusses support for the government's role in protecting the environment. Part 3 features environmental activities. The research methodology is explained and an appendix is included that summarizes change in attitude over time and analyzes responses by gender. (CCM)

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The National Report Card on Environmental Knowledge, Attitudes and Behaviors

The Seventh Annual Survey of Adult Americans

The National Environmental Education & Training Foundation

Roper Starch Worldwide
Turning Data into Intelligence Worldwide

DECEMBER 1998

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The National Report Card on Environmental Knowledge, Attitudes and Behaviors

The Seventh Annual Survey of Adult Americans

The National Environmental Education & Training Foundation and
Roper Starch Worldwide ***Turning Data into Intelligence Worldwide***

December 1998

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The National Environmental Education & Training Foundation

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Main Street America's View of the Environment

The *1998 NEETF/Roper Survey* reveals there is persistent misinformation concerning the environment in America. These "myths" can stand in the way of our addressing more immediate and wide-ranging issues. What follows is a summary of some of these misperceptions through the eyes of the average American.

Pollution-Free Energy – A majority of the public thinks (incorrectly) that energy is produced in non air-polluting ways in America, mostly by hydroelectric power. Only one in three sees coal burning as an issue.

Widespread Industrial Water Pollution – Nearly half think the leading cause of water pollution is factories. Pollution running off the land (our leading problem) is not identified by four of five Americans.

Dangerous Spray Cans – Americans think ozone-depleting CFCs come mostly from aerosol cans despite a 1978 ban. Only one in three sees air conditioners and refrigerators as the issue.

Safe Underground Nuclear Storage – Many Americans think spent fuel from nuclear plants goes to a deep underground safe haven out West. Just one in six knows that a permanent storage has yet to be found.

Diaper-Clogged Landfills – Much of the public sees disposable diapers as the main source of waste in landfills. Just one in four sees the vast amount of paper we pour into crowded landfills as the issue.

Worldwide Famine – Americans incorrectly believe famine, not pollution, is the leading cause of childhood death worldwide. Only one in eleven knows micro-organisms in the water are the cause.

Rampant Oil Spills – Only one in six Americans knows that changing one's car oil is the main source of petroleum pollution in rivers, lakes and bays—most think it is oil rigs, tankers and refineries.

Animals Ensnared in Beverage Six-pack Rings – Millions of Americans snip six-pack rings, seen by a majority as the leading entanglement problem. Unfortunately millions more cut and leave their fishing lines out in the wild (the leading cause of entanglement).

Routinely Tested Bottled Water – A majority think it is regularly tested by the government. It is not.

Tested-Safe Household Chemicals – A majority assume that some government agency must also be screening household chemicals for health and environmental safety. None does.

Tap Water Tested Routinely for Animal Waste and Pesticides – A majority of Americans think the water utilities routinely test for these pollutants, when only a few test for these pollutants.

Introduction

The National Environmental Education & Training Foundation (NEETF) commissioned a Roper Starch Worldwide survey to help America's leaders—educators, policy makers, business executives, media representatives and the general public—better understand what Americans know about the environment. The survey includes an assessment of their attitudes and behaviors around environmental issues as well. Using a quiz style format, *The 1998 National Report Card* (also referred to as the *NEETF/Roper Survey*) examines the public's belief in environmental "myths"—outdated or erroneous information about the environment. This misinformation must be corrected if the public is to understand why laws are passed to protect the environment and how they, themselves, can become a part of the solution.

The *1998 NEETF/Roper Survey* is a continuation of seven straight years of data gathering about Americans' views on the environment. *The National Report Card* was launched in 1992 by Times Mirror Magazines in collaboration with Roper Starch. Times Mirror commissioned each of the first four years of the survey, and NEETF took over the project in 1995.

The National Environmental Education & Training Foundation is a private nonprofit organization authorized by Congress in 1990. The Foundation strives to help America meet critical national challenges by connecting environmental learning to progress on issues of national concern such as health care, educational excellence, our competitive position in business and effective community participation in managing our natural resources. In addition to making leveraged challenge grants for outstanding environmental projects across the nation, NEETF seeks funds to support several innovative environmental education programs, which include, along with *The National Report Card*:

- **Wellness & The Environment**—integrating environmental health into our public health and health care systems.
- **Safe Drinking Water Program**—providing an educational backdrop to government Consumer Confidence Reports on drinking water.
- **Institute for Corporate Environmental Mentoring**—fostering business-to-business mentoring to help companies improve environmental and economic performance.
- **Environmental Education and Academic Excellence**—promoting effective, science-based and objective environmental education as beneficial to students' academic performance.
- **National Public Lands Day**—a nationwide, volunteer driven program improving and enhancing national parks, forests, lakes, wildlife habitats and other public land sites.

Overview and Highlights

As with its six predecessors, the *1998 NEETF/Roper Survey* investigates environmental knowledge, attitudes and behaviors among adult Americans. While the environment is not always a daily front-page issue, in the late 1990s, the subject is as full of public importance and controversial positions and statements as ever. Water and air pollution, toxic waste, Superfund sites, the use of public lands for commercial purposes and the protection of endangered species are all issues facing the nation today. Attitudes about the issues vary by region, and even by household.

What are the sources of these differing attitudes? Are the positions people hold based on fact or fiction? To determine the extent to which Americans support inaccurate positions, this year's study includes a section centered around some common misperceptions or "environmental myths"—popular but incorrect information about environmental issues and problems. Once such myths are identified, educational programs can be created to address the differences between fact and fiction, fostering a population that better understands why laws are passed to protect the environment and how their own actions have an impact on the environment.

For the most part, general attitudes toward the environment and toward laws and regulations designed to protect the environment have remained stable over the last few years. While government intervention is questioned in many arenas of public life, Americans continue to largely support government programs when the environment is the area in question. And, many feel that the next few years will be critical for the long-term health of the planet.

The 1998 National Report Card: Environmental Knowledge, Attitudes and Behaviors evaluates public attitudes as they exist today and have changed over the past seven years. It is based on a nationally representative sample of 2,000 Americans, age 18 and older, surveyed by Roper Starch Worldwide in May 1998.

Environmental Knowledge and Environmental Myths

Although many Americans report that they possess some environmental knowledge, when asked to distinguish between environmental myths and environmental truths, the public encounters considerable difficulty. Not only do prevailing myths exist, but misconceptions are widespread on a number of issues. Thus, examining the responses of those who give the myth response is as enlightening for planning environmental education programs and policy initiatives as is calculating the percentages of those who identify the correct answers.

- For the fourth year in a row, about two-thirds of the American public rate themselves as having either "a lot" (10%) or "a fair amount" (58%) of knowledge about environmental issues and problems. As in past years, men are more likely than women to report they have at least a fair amount of environmental knowledge.

- However, the environmental myths section in this report leads us to question these expressions of environmental knowledge. Presented with ten questions that each contained a myth answer, two plausible but incorrect answers and a correct answer, the myth response receives a plurality in seven cases. In fact, for three of the ten questions, a *majority* of Americans gave the incorrect myth answer.

- The pervasiveness of environmental myths is surprising, as there are few consistent trends among demographic subgroups. Even those who say they know "a lot" about the environment support the myth response for several issues. The fact that there are few differences among subgroups—education, income—highlights the universal and persistent nature of the incorrect beliefs and the need for further environmental education for all Americans.

- Looked at from the perspective of *correctly* identifying environmental truths, Americans average just 2.2 correct answers out of 10 (random guesses would have produced 2.5 correct responses). In addition, two important subgroup differences emerge. First, men are more likely than women to correctly answer seven of the 10 questions (though men average just 2.7 correct answers). Second, Americans with a college degree are consistently more likely than those with a high school education or less to give the correct answer (though even those with a college degree average just 3.1 correct answers).

Specific responses to myth questions are:

- ***How Most Electricity in the United States is Generated***—Just 27% of Americans know that most of our electricity (70% of total production) is produced by burning coal and other flammable materials. The myth response to the electricity question is "hydropower" which provides only about 10% of America's power needs and is a major portion of the energy market in just one region—the Northwest. But, 38% of Americans see dams as our leading method of electricity production. Hydro, nuclear and solar power account for about 30% of our total energy supply, and yet 55% of Americans—a clear majority—think that most of our energy comes from these non-air-polluting sources.

- ***Pollution of Rivers and Streams***—Only one in five Americans (22%) knows that run-off is the most common form of pollution of streams, rivers and oceans while nearly half (47%) think the most common form is waste dumped by factories. Another 15% of Americans think garbage dumping by cities is the main cause of water pollution.

- ***Recycling of Paper***—When asked about the environmental benefit of recycling paper, the concept of recycling for tree-saving prevails on a 63% basis over the reduction of waste headed for crowded landfills (24%). The general public is highly attuned to the idea that trees are valuable natural resources and habitat for wildlife. The public does not recognize, however, the goal of reducing waste going to landfills as a significant benefit of recycling programs.

- ***Wildlife Entanglement***—The 1980s images of dead or injured birds or fish entangled in plastic beverage six-pack rings had a great impact; 56% of Americans say the rings are the main cause of fish and wildlife entanglement. However, the main cause of such entanglement, according to the Center for Marine Conservation in Washington, D.C., is abandoned fishing line left by America's 70 million anglers—a fact known by just 10% of Americans.

- ***Spent Nuclear Fuel***—A total of 34% of Americans believe that the used fuel rods at nuclear plants are safely stored in a deep underground facility in the West. Half as many (17%) know the rods are stored temporarily on the plant site and are monitored pending longer-term solutions. Fully 35% do not know what happens to the spent fuel rods.

- ***Leading Cause of Childhood Death Worldwide***—Only 9% of the American public understands that micro-organisms in water supplies are the leading cause of childhood death worldwide. The majority of Americans (55%) have most likely been influenced by harrowing public reports of famine and starvation in the world and believe it is a lack of food that causes childhood death more than contaminated water.

- ***Main Source of Oil in Rivers, Lakes and Bays***—About one in seven Americans (16%) knows that individuals changing motor oil is the main source of oil getting into our surface water, while 40% think (incorrectly) that the source is oil spills from ships and offshore oil wells. Another 17% think it is mostly from discharges from coastal oil refineries.

- ***Current Source of Chlorofluorocarbons (CFCs)***—A CFC ban for aerosol cans took place in 1978 when suspicion grew that the chemical may deplete protective ozone in the Earth's upper atmosphere, and yet 32% of Americans still believe that spray cans are the only source of CFCs in America today. CFCs *are* still in auto air conditioners and refrigerators, yet only 33% of Americans are aware of this fact. Another 9% think styrofoam cups are the only source of CFCs, while 20% of Americans respond that they do not know.

- ***Greatest Source of Landfill Material***—Nearly one-quarter of Americans (23%) know that paper is the greatest source of landfill material, while 29% think that the disposable diaper is the greatest threat to our crowded landfills.

- ***Definition of a Watershed***—About two out of five Americans (41%) are able to identify the term watershed as a land area that drains into a specific body of water. Yet, 35% choose not to venture a guess even when presented choices of definitions.

Continued Support for Government's Role in Protecting the Environment

Though they may not believe all the information the government provides about the environment, Americans generally express a desire for the government to remain involved in environmental protection. In fact, over the last few years, attitudes toward the government's intervention in the environment have been supportive and stable. Whether this trend is a permanent change in attitude or a result of the thriving national economy will be determined only over time.

- The majority of the American public (62%) continues to say that environmental protection and economic development can go "hand in hand." A slowly rising minority (28%, statistically unchanged from 1997, but up five percentage points from 1995) believe that a choice must be made between the two spheres.

- When forced to choose one over the other, environmental protection (71%) is considered vastly more important than economic development (17%). In fact, it appears that most of those who say a choice is necessary between the environment and the economy come down on the side of environmental protection (choosing the environment is up eight percentage points since 1995).

- With regard to current laws and regulations protecting the environment, attitudes have been stable since 1995. A plurality (46%) believe current laws do not go far enough. Just under a third say laws have struck about the right balance, while 17% say that the laws currently on the books go too far. Gender and age differences continue to exist, with women and those under the age of 45 more likely to say current laws do not go far enough, and men and those age 45 or older are more likely to say current laws go too far. These attitudes and trends are also evident when the public is asked about five specific areas of regulation: water pollution, air pollution, protection of wild or natural areas, protection of wetlands and protection of endangered species of plants, animals and insects.

- Endangered species seems to be a "hot button" for those who dislike current environmental regulations. While 18% of all Americans say that laws protecting endangered species go too far, among those who think environmental laws in general go too far, 51% think regulations protecting endangered species go too far, for a difference of 33 percentage points. By way of comparison, those who think environmental regulations overall go too far are 24 points more likely than the national average to think that laws protecting wetlands go too far; 24 points more likely to have this opinion of laws protecting wild or natural areas; 21 points more likely to feel laws to fight air pollution go too far; and 12 points more likely to hold this belief about laws to fight water pollution.

- Concern about the planet's future remains high: a majority of Americans (57%) continue to agree that "the next 10 years are the last decade when humans will have a chance to save the earth from environmental catastrophe." This concern has risen since 1995 by ten percentage points (from 47% to 57%).

- Even when Government does not play a role, Americans may assume it does. Fully 65%—or two out of three—Americans assume (incorrectly) that household and industrial chemicals are routinely tested by the Environmental Protection Agency or some other government agency.

- Some 59% of Americans say (incorrectly) that tap water is routinely tested and filtered to remove contamination from livestock and pesticide run-off.

- More than half of Americans (51%) say (incorrectly) that bottled water is tested for safety and purity by a government agency. Just 42% of Americans know it is not tested.

The Impact of a Higher Level of Environmental Knowledge on Environmental Attitudes

The *1998 NEETF/Roper Survey* looked at prevailing environmental myths to determine their persistence and whether they are actually blocking a more appropriate up-to-date focus on current environmental problems. Because the average mean response on the *1998 NEETF/Roper Survey* myths quiz was 2.2 correct answers (out of ten questions), we formed a low-knowledge group at three or fewer correct responses and a high-knowledge group of four or more correct responses. Each group's responses were then compared on key questions:

- On the question of whether the environment and the economy can go hand in hand, there was little difference between the high-environmental-knowledge group (65%) and low-environmental-knowledge group (62%) with the majority of both groups believing a balance can be found between the environment and the economy.

- On whether one would pick the environment or the economy if one must choose between them, 73% of the low-knowledge group would pick the environment as compared to 66% of the high-knowledge group.

- On whether environmental regulation has gone too far, not far enough or has achieved the right balance, the most telling difference between the high-knowledge and low-knowledge groups is between those who feel that the right balance has been achieved. A total of 29% of the low-knowledge group thinks there is balance while 35% of the high-knowledge group sees regulation as having achieved balance.

- On air pollution regulation, the low-knowledge group is five percentage points (at 61%) more likely than the high-knowledge group (56%) to think that regulation of air pollution has not gone far enough and nine percentage points less likely (24% versus 33%) to think that balanced air pollution regulation has been achieved.

- On the regulation of wild or natural areas, there is no statistical difference between the high-knowledge and low-knowledge groups.

- On the regulation of endangered species, there are considerable differences between the high- and low-knowledge groups. A total of 15% of the low-knowledge group feel endangered species regulation has gone too far, while 23% of the high-knowledge group hold that belief. Correspondingly, 47% of the low-knowledge group feel that endangered species regulation should go further as compared to 40% of the high-knowledge group.

- On water pollution regulation, 73% of the low-knowledge group think that water pollution regulation should go further, while 63% of the high-knowledge group have that feeling. And, 18% of the low-knowledge group feel the right balance has been achieved, and 30% of the high-knowledge group have that belief.

- On whether we face an environmental catastrophe in the next ten years, 59% of the low-knowledge group agrees we could face a catastrophe in the next ten years compared to 47% of the high-knowledge group.

Environmental Activities

Whether they realize it or not, many Americans perform activities each day that benefit the environment. Some conserve water, others volunteer time and effort to clean up public lands, and others simply recycle some of the products and containers they use everyday. These activities are important because they involve Americans in the environment and its protection, (even if only through indirect means) and are part of the Concern - Education - Behavior nexus developed in the last two NEETF/Roper studies.

- Asked the frequency with which they do each of 11 environmental activities, a majority of the public performs the following four "frequently": turning off lights and appliances when leaving a room (85%); recycling things such as newspapers, cans and glass (65%); trying to cut down on the amount of trash and garbage their household creates (62%); and conserving water in their home and yard (61%).

- It should be noted that each of the most frequently engaged activities can be done around the household and is not necessarily linked directly with the environment. By comparison, activities that directly reflect concern about the environment are performed frequently by no more than one American in ten.

- There is a definite relationship between environmental knowledge, concerns and behaviors. For nine of the eleven activities that benefit the environment, the likelihood that people perform each activity frequently increases proportionately with their environmental knowledge. The only exceptions are turning off lights and appliances (which nearly everyone does) and the use of alternative forms of transportation (which may depend more on regional infrastructure and availability than concern about the environment).

- Clearly, concern about and knowledge of the environment do have an effect on the likelihood of engaging in day-to-day activities that directly or indirectly benefit the environment. Thus, increasing environmental knowledge for all Americans should increase individual involvement in environmental affairs, and should help Americans to understand the impact of decisions affecting the environment.

Part One

Environmental Knowledge and Environmental Myths

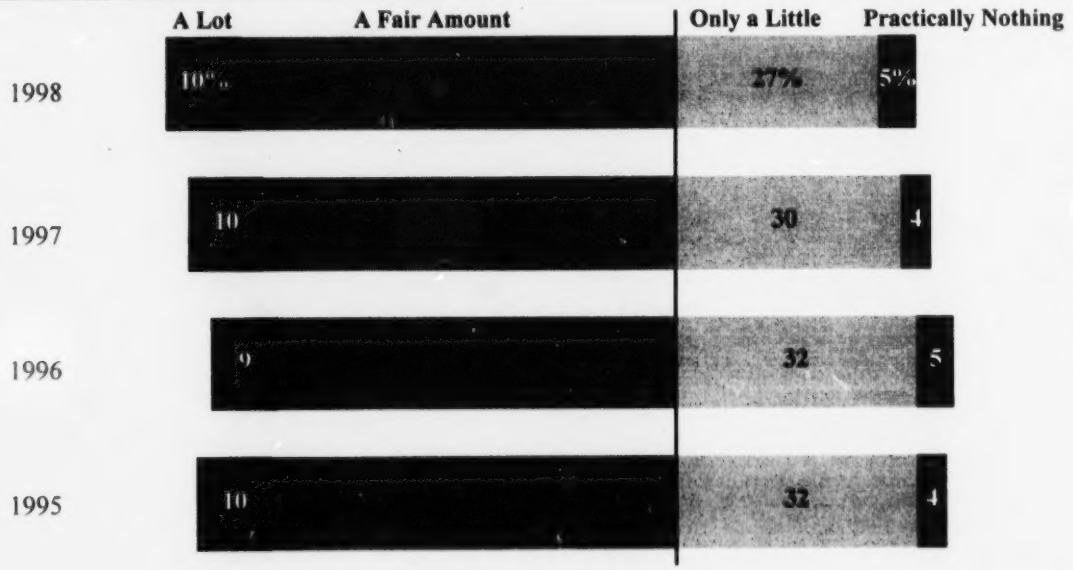
Part I. Environmental Knowledge and Environmental Myths

While two-thirds of Americans report that they know either "a lot" or "a fair amount" about the environment (statistically unchanged from the 1997 *NEETF/Roper Survey*), when specifically tested on their environmental knowledge, many Americans have misinformation and express beliefs which are, in fact, myths. This is true even among those who say they have a fairly high level of environmental knowledge. Thus, examining who gives the myth responses is as enlightening for planning environmental education programs and policy initiatives as looking at the percentages of people who answer each question correctly.

Americans Rate their Own Environmental Knowledge

For the fourth year in a row, Americans were asked to define the extent of their own knowledge about environmental issues and problems. And, for the fourth year in a row, about two-thirds report that they know either "a lot" (10%) or "a fair amount" (58%) about the topic, while the remainder say they know "only a little" (27%) or "practically nothing" (5%). It should be noted that while the percentage saying they know a lot is unchanged over time, the percentage giving the "a fair amount" response has increased since 1996 (up 5 percentage points).

Figure 1: Knowledge of Environmental Issues and Problems



Question wording: *In general, how much do you feel you know about environmental issues and problems—would you say you know a lot, a fair amount, only a little, or practically nothing?*

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As seen in previous years, there are important differences among gender, education and age subgroups for the combined know "a lot" and know "a fair amount" figures. On a self-reported basis, 72% of men say they know *at least* a fair amount about environmental issues (13% "a lot"), compared to 65% of women (8% "a lot"). Self-reported environmental knowledge increases dramatically with education, from 60% among those who are high school graduates, to 75% of those with some college, and to 81% of those with at least a college degree.

In a pattern also seen in 1997, self-reported environmental knowledge peaks among those age 35-44 (70%) and 45-64 (73%), compared to 66% among 18-34 year olds and 59% among those 65 or older. Despite increased emphasis on environmental education in schools and colleges in the last two decades, it may be that life experience and exposure to popular media such as newspapers and television have provided Americans age 35 to 64 with the information they believe makes them knowledgeable about environmental issues and problems.

Measuring Belief in Environmental Myths

In an attempt to measure how much Americans really know about the environment, as opposed to what they think they know, the *1998 NEETF/Roper Survey* asked the public ten multiple-choice questions and five true/false questions. Each of the multiple-choice questions had four possible answers—the correct answer, two plausible sounding but incorrect answers and one myth answer. Americans were also given the option to say that they "don't know" the answer. Each question addressed an issue that has been covered in the media over the past year.

In reviewing the results, it becomes clear that belief in environmental myths is pervasive, often obscuring the work that has been done to promote a healthy environment. And, since family members are the fourth largest source of environmental information for young people today, after television, school and newspaper articles (*NEETF/Roper Youth Report, 1994*), this trend is especially alarming as kids often adopt the attitudes and opinions of the adults around them.

Focusing first on the ten multiple-choice questions, the myth answer is given most often in seven cases. In fact, in three cases, a majority of Americans give the incorrect myth response:

Figure 2: Percentage Giving Myth Response

Content of Environmental Knowledge Question	Percentage Who Gave Myth Response
The goal of paper recycling programs	63%
Leading cause of entanglement	56%
Leading cause of childhood death worldwide	55%
Most common source of water pollution	47%
Primary source of oil found in rivers, lakes, bays	40%
How most electricity in the United States is generated	38%
How the United States disposes of spent nuclear fuel	34%
Only current sources of CFCs in the United States	32%
Greatest source of landfill material	29%
Definition of a watershed	11%

In other words, despite the fact that two-thirds of the American public report knowing at least a fair amount about the environment, many actually subscribe to environmental myths. Moreover, for several issues, those who think they know the most, are the ones who are actually most likely to believe the environmental myth. When asked about the leading cause of wildlife entanglement, 64% of those who say they know a lot about the environment give the myth response, compared to 59% of those who say they know a fair amount and 48% of those who say they know only a little or practically nothing about environmental issues and problems. Similarly whereas 45% of those with the most self-reported knowledge give the myth response when asked about how the United States currently disposes of spent nuclear fuel, this falls to 38% of those with a fair amount of knowledge and 24% of those with only a little or practically no environmental knowledge. This pattern also holds true for the greatest source of landfill material.

Figure 3: Belief in Environmental Myths by Self-Reported Environmental Knowledge

Content of question:	Total Myth	Self-Reported Environmental Knowledge: A lot	A fair amount	Little/ practically nothing
	%	%	%	%
The goal of paper recycling programs	63	63	65	59
Leading cause of entanglement	56	64	59	48
Leading cause of childhood death worldwide	55	60	53	55
Most common source of water pollution	47	36	48	47
Primary source of oil in rivers, lakes and bays	40	40	40	40
How most of the electricity in the United States is generated	38	39	40	34
How the United States disposes of spent nuclear fuel	34	45	38	24
Only current source of CFCs in the United States	32	30	30	34
Greatest source of landfill material	29	36	29	27
Definition of a watershed	11	5	10	16

Among the demographic subgroups, men and women are equally likely to give the incorrect myth answers to seven of the ten questions. The exceptions are:

- most common water pollution source—50% of women believe the myth versus 43% of men;
- how the United States disposes of spent nuclear fuel—43% of men believe the myth, versus 26% of women; and
- greatest source of landfill material—more women (34%) believe the myth than men (24%).

Formal education has a mixed impact on responses to the ten questions. For two items, "primary source of oil found in rivers, lakes, bays" and "greatest source of landfill material," as educational level increases, the percentage giving the myth response decreases. However, for two other items, "leading cause of entanglement" and "how the United States disposes of spent nuclear fuel," the percentage giving the myth response actually increases with education. (For the other issues, results are not affected by level of education).

There are no consistent trends by age or region. In fact, the relatively few differences among demographic subgroups in supporting the environmental myths highlights the universality of the incorrect beliefs, and the need for more environmental education for all Americans.

Seeing the Truth Through Environmental Myths

Since many Americans believe in the environmental myths, while others give either of the two plausible, but incorrect responses, the percentage who correctly answer each of the ten questions is relatively small. As seen in the table on the following page, at most 41% and as few as 9% give the correct answer to any one of the questions. These low figures are especially important since knowledge is often linked to behavior (a pattern explored in Part Three of this report), and changing the public's behavior is the goal of laws and regulations to protect the environment. In fact, Americans correctly answer an average of just 2.2 questions. Random guesses would have produced 2.5 correct responses due to the four-answer multiple choice format of the quiz.

Figure 4: Percentage Giving Correct Answer

Content of Environmental Knowledge Question	Percentage Who Answered Question Correctly
Definition of a watershed	41%
Only current sources of CFCs in the United States	33%
How most electricity in the United States is generated	27%
The goal of paper recycling programs	24%
Greatest source of landfill material	23%
Most common source of water pollution	22%
How the United States disposes of spent nuclear fuel	17%
Primary source of oil found in rivers, lakes, bays	16%
Leading cause of entanglement	10%
Leading cause of childhood death worldwide	9%

While in some cases *high* self-reported environmental knowledge corresponds with *high* belief in environmental myths, those who say they know a lot about the environment do give the correct response more often than the other knowledge subgroups for six issues. For example, though just one-third of all Americans in general can identify the only current sources of CFCs in the United States, 44% of those who say they have a lot of environmental knowledge answer this question correctly, compared to 35% of those who say they have a fair amount of knowledge and 26% of those who say they possess only a little or practically no environmental knowledge.

Figure 5: Seeing the Truth Through Environmental Myths by Self-Reported Environmental Knowledge

		Self-Reported Environmental Knowledge		
	Total Correct	A lot	A fair amount	Little/ practically nothing
	%	%	%	%
Definition of watershed	41	58	43	30
Only current source of CFCs in the United States	33	44	35	26
How most of the electricity in the United States is generated	27	35	30	20
The goal of paper recycling program	24	21	25	24
The greatest source of landfill material	23	22	26	18
Most common source of water pollution	22	31	23	18
How the United States disposed of spent nuclear fuel	17	20	19	13
Primary source of oil in nation's rivers, lakes, bays	16	25	16	11
The leading cause of entanglement	10	8	10	10
The leading cause of childhood death worldwide	9	18	10	6

However, those who say they have a lot of environmental knowledge correctly answer an average of only 2.8 questions, slightly higher than the 2.4 average for those saying they have a fair amount of environmental knowledge and just one question better than those who say they know only a little or practically nothing of environmental issues and problems (1.8 correct). Thus, the self-reported level of environmental knowledge can be a useful, but not always reliable, method of measuring *actual* environmental knowledge.

That said, men—discussed earlier as reporting greater environmental knowledge than women—are more likely than women to give the correct answer to seven of the ten questions. This "gap" in knowledge is especially evident for the definition of a watershed (49% of men answered correctly versus 33% of women), how most electricity in the United States is generated (36% versus 19%), and the most common source of water pollution (29% versus 15%). The reason for this gap is unclear and requires further study. While men know more about the environment, there is still a long way to go before they can be considered knowledgeable on environmental issues: men average only 2.7 correct answers. Women fare even worse, with an average of just 1.8 correct answers.

Figure 6: Seeing the Truth Through Environmental Myths by Gender

		Gender	
	Total Correct	Male	Female
	%	%	%
Definition of watershed	41	49	33
Only current source of CFCs in the United States	33	37	30
How most of the electricity in United States is generated	27	36	19
The goal of paper recycling programs	24	25	24
The greatest source of landfill material	23	28	19
Most common source of water pollution	22	29	15
How United States disposed of spent nuclear fuel	17	21	14
Primary source of oil in nation's rivers, lakes, bays	16	20	11
The leading cause of entanglement	10	9	10
The leading cause of childhood death worldwide	9	11	8

Though level of education had a mixed impact on belief in environmental myths, when it comes to answering the questions correctly, education has a single, consistent effect: Americans with a college degree are significantly more likely to give the correct answer than those with a high school education or less. For example, while 32% of those with a high school education know the definition of a watershed, this figure rises to 44% among those with some college and to 60% among college graduates (the only exception to this is the issue of entanglement, which few answer correctly regardless of education level).

Still, there is work to be done at all levels, as those with a high school education average just 1.8 correct questions, those with some college average 2.4 correct and college graduates answer an average of only 3.1 questions correctly.

Figure 7: Seeing the Truth Through Environmental Myths by Education

		Education		
	Total Correct	High school graduate or less	Some college	College graduate or more
	%	%	%	%
Definition of watershed	41	32	44	60
Only current source of CFCs in the United States	33	30	30	45
How most of the electricity in the United States is generated	27	22	28	39
The goal of paper recycling programs	24	19	31	30
The greatest source of landfill materials	23	19	25	31
Most common source of water pollution	22	17	22	34
How United States disposed of spent nuclear fuel	17	13	17	28
Primary source of oil in nation's rivers, lakes, bays	16	12	20	20
The leading cause of entanglement	10	10	10	8
The leading cause of childhood death worldwide	9	6	11	16

Myth by Myth

What follows is an analysis of how each question in the ten-question multiple choice myth quiz was handled by the public:

-How is Most Electricity in the United States Generated?

This question was asked for the second straight year, and there was no significant variation from the previous year's responses. Only 27% of Americans know that most of our electricity (some 70% of all electricity) is produced by burning coal and other flammable materials. Coal-burning has implications for air quality in both the United States and in the larger context of the global warming debate. Importantly, most of the coal burned today is for energy purposes.

The myth response to the electricity question is hydropower which, ironically, provides just about 10% of America's power needs and is only a major portion of the energy market in just one region—the Northwest. However, 38% of Americans see dams as our leading method of electricity production, in spite of the fact that water power accounts for such a small percentage of the total for the nation. As expected, the western region of the country (which includes the Pacific Northwest) gives the highest rating to hydropower, at 44%. What accounts for this misperception? One can only speculate that it may reflect the view of American dams as engineering wonders and as heroic works—similar to many of the nation's large bridges. Dams might also reflect a powerful theme—harnessing the forces of nature—and for that reason are larger-than-life in the American mind. Nonetheless, the hydropower myth is very strong with two of five Americans believing dams are America's major power producer.

Indeed, hydro, nuclear and solar power account for about 30% of our total energy supply and yet 55% of Americans, a clear majority, think that most of our energy comes from these non-air-polluting sources. The *1997 NEETF/Roper Survey* showed that two of three Americans are aware that motor vehicles emit carbon directly into the atmosphere, but in the 1998 survey, power production using coal, which is also a major source of carbon, is understood by just one in four Americans. Policymakers concerned with air pollution and global warming issues should heed the role of the hydropower myth and other misconceptions in having the public understand the global warming and "greenhouse gases" debate.

There are also noteworthy regional variations to the responses to this question. In the Northeast, which has more of an industrial heritage, 34% know that coal is the major energy source for electricity production. In the West, where much of the power is produced by large hydroelectric power dams, 44% of its residents think water power is the main energy source for the nation.

-Main Form of Pollution of Rivers and Streams

This question was also asked for a second straight year with little variation in response rates. It points out how few Americans understand that precipitation running off from farm fields, roads, parking lots and lawns (called "non-point source" pollution) is the leading cause of water pollution in America today. Just 22% of Americans know that run-off is the most common form of pollution of streams, rivers and oceans while nearly half (47%) think the most common form is waste dumped by factories. Another 15% of Americans believe garbage dumping by cities is the main cause of water pollution. Factories and municipalities remain a cause of water pollution in America today and surely must continue their clean-up efforts, but they are no longer the leading cause as they were in the 1960s and 1970s.

Many government programs are acknowledging the importance of looking closely at run-off pollution and are focusing on land use management, improved farming and timber practices and more. But, for these programs to ultimately be successful, there must be widespread understanding of the run-off problem—how to prevent it and how to clean it up. *The 1998 NEETF/Roper Survey* shows that Americans are far from having such understanding.

Indeed, Americans routinely identify clean and safe water as a top priority, but they seem reluctant to accept that their own day-to-day actions have a substantial effect on water quality. As Congress looks to re-authorize the Clean Water Act and various states consider changes in their own water quality programs, the lack of understanding of water pollution and its major causes stands as a serious impediment to appropriate policies and actions.

-Primary Goal of Recycling Paper

Recycling programs are highly popular throughout America. And, paper recycling is an important part of any community-wide recycling effort. It is clear that recycling is an idea that has caught on in America as something positive that can be done to protect the environment. But, the goals of recycling need to be better understood by the public.

Many Americans have the notion that recycling paper is primarily done to reduce the number of trees cut for paper production. It stands to reason that reusing paper would have that effect. But, when asked about the environmental benefit of recycling paper, many Americans fail to recognize the important role recycling plays in reducing wastes going to landfills—the tree-saving concept still prevails on a 63% to 24% basis.

Most paper in America does not come from wild forests but instead comes from planted forests where trees are grown primarily for the purpose of later harvest. Professional foresters see the idea that recycling paper saves trees as failing to recognize that most of the trees used to make paper were planted for harvest to begin with, and the area is usually re-planted once cut. The general public is probably more attuned to the concept that trees are valuable natural resources, unique in nature and habitat for wildlife. Irrespective of one's view on cutting trees for paper, America has very serious problems identifying needed landfill space.

-Wildlife Entanglement

The 1980s images of dead or injured birds or fish entangled in plastic beverage six-pack rings had a great impact on people all over America. In kitchens, in schools, on boats and at campsites across the nation, children and adults alike conscientiously snip empty beverage six-pack rings with knives and scissors to keep wild animals from becoming snared and possibly harmed. This "snipping" practice is widespread and is clear evidence of how the public can be mobilized around an issue (particularly one involving consumer practices) and how we can change the public's behavior.

However, plastic six pack rings are in fact not the leading cause of fish and wildlife entanglement in the United States or elsewhere. The main cause of such entanglement by far, according to the Center for Marine Conservation in Washington, DC, is abandoned fishing line—a fact known only by 10% of the survey respondents. Millions of anglers throughout America may be dutifully snipping their six pack rings, but are just as readily cutting snagged fishing lines and leaving them in the wild to trap fish and wildlife. The myth—it is important to snip plastic rings—is enhanced by the fact that all such rings are now designed to become brittle and breakable when exposed to direct sunlight such as they would if left outside floating on a lake or river.

-Spent Nuclear Fuel

There are 105 nuclear power plants in the United States generating approximately 20% of the nation's power. These plants make use of nuclear fuel rods that maintain a controlled nuclear reaction to power the plant and generate electricity. These fuel rods can produce energy for three to five years and then are no longer useful for that purpose. Though "spent" for fuel purposes the rods are still radioactive and will be for decades to come. They must be handled safely. Since nuclear power plants were first placed into service some three decades ago, a long-term solution to how to permanently store spent fuel rods has not been found. It is a troubling issue for the public, the government and the utility companies alike.

There has, however, been considerable coverage of efforts to store the rods long-term in underground caves in the West or in other "safe" places. But, these solutions have never come to fruition and the issue has remained controversial and unresolved. Instead, there are temporary handling facilities at each of the nuclear plants that hold the spent fuel rods pending a more permanent solution.

A total of 34% of Americans believe that the spent fuel rods are safely stored in a deep underground facility in the West. Just 17% correctly know that the rods are stored temporarily on site and are monitored. Significantly, 35% say they do not know what happens to the spent fuel. It would seem that media coverage of the controversies around storing the waste on a permanent basis may have led to the evolution of a myth that the problem has been taken care of and safe permanent facilities have been developed. Even in the West, where one might expect residents to know that deep underground nuclear fuel handling facilities have never been established there, 37% (the most of any region) think such facilities exist.

-Leading Cause of Childhood Death Worldwide

The role of the environment in worldwide loss of life is one of the most critical and least understood of any of the environmental myths addressed in *The 1998 National Report Card.* Public health officials around the world have documented that literally millions of child deaths each year are the result of microorganisms and other pollutants in water supplies. These often lead to gastrointestinal disease which in turn leads to dehydration and even starvation. But, only 9% of the American public understands this fact.

The truth is that poor public health practices and unsafe water are killing so many of the world's children each year. The majority of Americans (55%) have most likely been influenced by harrowing public reports of famine and starvation in the world and believe it is a lack of food rather than contaminated water that causes most childhood deaths.

The prevalence of the myth that lack of food is the main cause of childhood death could divert attention from the need for effective public health and environmental protection efforts in many nations around the world.

-Main Source of Oil into Rivers Lakes and Bays

According to the U.S. Environmental Protection Agency, many millions of gallons of petroleum find their way into the rivers, lakes and bays of the nation each year. Indeed, there was a time, some 30 years ago, when much of this petroleum came from American industries ranging from production factories to oil refineries. Today, however, the automobile produces most of this petroleum and the oil itself comes from individuals changing their car oil and dumping it down a nearby storm drain or pouring it into the ground. Mid 1990s estimates were that 17 million gallons per day—more than the Valdez oil spill—were dumped by individuals. But, just 16% of the American public know this fact, while 40% believe the oil comes primarily from ships and offshore oil well spills, and 17% think it comes mostly from coastal oil refinery discharges.

As with the most common cause of water pollution, Americans see larger facilities as the main problem rather than their own actions. Certainly steps must be taken by the petroleum industry to prevent oil spills and other pollution problems. But, America's car owners must come to understand they are now the number one oil pollution source, if this problem is to be overcome. A noteworthy regional variation is that just 11% of people from the Northeast answer this question correctly while 20% of people in the West got the answer right.

-Current Source of Chlorofluorocarbons (CFCs)

In 1978 chlorofluorocarbons (CFCs) were banned in aerosol spray cans in the American markets due to concern about their release into the Earth's upper atmosphere and their potential impact on the globe's protective ozone layer. Yet, 32% of Americans still say that spray cans are the only source of CFCs in America today. The fact is that CFCs are still in auto air conditioners and refrigerators, which only 33% of Americans seem to recognize. Another 9% think Styrofoam cups are the only source of CFCs, while 20% of Americans say they do not know.

A media-based consumer awareness campaign produced profound public sensitivity to the spray can issue, but efforts to make people aware that CFCs have been banned from aerosol cans did not reach the same awareness level. Some spray can producers may actually add to the confusion by promoting their products as "CFC-free" due to the strength and persistence of this myth. In the Northeast, 39% answered that spray cans were the leading CFC source while 27% of those in the West gave that answer.

-Greatest Source of Landfill Material

Notwithstanding the move into the computer age and the beginning of a switch to a paper-free society, paper products are still the number one source of landfill material in America. However, only about one American in four (23%) knows this, while 29% incorrectly think that disposable diapers are the greatest threat to our crowded landfills. This comes in part from yet another media-based consumer awareness campaign that, in the early-to-mid 1980s, cited diapers as a significant environmental problem. But the myth soon evolved so that diapers are seen by many as the *leading* source of landfill material. Indeed, diapers *are* a source of landfill material and efforts to reduce waste of all sorts should continue. But, newspapers, boxes, packaging and office paper should be clearly understood as the greatest single source and a necessary focus of reduction, reuse and recycling programs.

Only 18% of Northeast residents responded correctly to this question while 27% of Midwesterners gave the right answer. By comparison, 33% of those from the Northeast gave the myth answer while just 26% of Midwesterners provided that response.

-Definition of a Watershed

In public policy discussions of water quality at the federal, state and local levels, the term "watershed" is mentioned with great frequency. It is defined as "an area of land that, due to its natural drainage pattern, collects precipitation and deposits it into a particular body of water." In the West these land areas are often called "drainages" and throughout the nation they are sometimes referred to as river or stream "basins."

The 1998 NEETF/Roper Survey provided the public with several possible definitions of a "watershed." A total of 41% of Americans are able to identify the term watershed as an area of land that drains into a specific body of water. But 35% are unable to venture a guess even when presented with choices of definitions. When considering that many of our water pollution problems come from run-off, there is clear logic to addressing water pollution issues through a drainage basin or watershed approach. The problem is that the public needs to be more aware of what a watershed is and what effect watersheds can have on their own activities. We note that *The 1998 NEETF/Roper Survey* asks people to choose a definition and does not ask them to define the term on their own. Actual knowledge of what a watershed really is (without prompting) would probably be considerably lower than 41%.

A second group of questions about environmental myths and truths was presented in a true/false format. Even when given only two choices, a majority of Americans opt for the myth response in three of five cases. (No more than 8% of Americans opt for the "don't know" response in each question.) The topic providing the greatest percentage of myth responses is government testing of industrial and household chemicals, which 65% answer incorrectly.

Figure 8: True/False Questions: Percentage Giving Myth Response

Content of True/False Question	Percentage Who Gave Myth Response
Government testing of industrial and household chemicals	65%
Testing of tap water for contaminants	59%
Government testing of bottled water	51%
Use of trees in national forests	19%
Replacement of extinct species	17%

Unlike several of the multiple-choice questions, responses to the true/false questions do not vary by level of self-reported environmental knowledge. The percentage giving the myth response varies little by gender (only for government testing of industrial and household chemicals, which is higher among men, 70%, than women, 61%) or region (only for government testing of bottled water does one region—the South, 58%, stand out from the rest of the nation), while no consistent trends are evident by age (though 59% of those age 18-34 give the myth response for government testing of bottled water, compared to 51% overall).

Agreement with the myth choice decreases significantly as education level increases for three of the questions, but is similar for the other two:

Figure 9: True/False Questions: Percentage Giving Myth Response by Education

Content of True/False Question	Total Myth Response	Education		
		High School or Less	Some College	College Graduate
	%	%	%	%
Government testing of industrial and household chemicals	65	66	69	60
Testing of tap water for contaminants	59	59	60	59
Government testing of bottled water	51	53	55	40
Use of trees in national forests	19	19	16	23
Replacement of extinct species	17	21	12	11

As with the multiple-choice questions, belief in the environmental myths is widespread among all Americans.

There are some subgroup differences in responses to the true/false questions compared to the multiple choice questions. For instance college graduates are more likely than those with less education to give the correct response for replacement of extinct species, government testing of bottled water, and government testing of industrial and household chemicals.

Figure 10: True/False Questions: Percentage Giving Correct Answer

Content of True/False Question	Percentage Who Answered Question Correctly
Use of trees in national forests	79%
Replacement of extinct species	78%
Government testing of bottled water	42%
Testing of tap water for contaminants	35%
Government testing of industrial and household chemicals	27%

Government Protecting the Public

Some of the *1998 NEETF/Roper Survey*'s true/false questions looked at people's perceptions of how protected they are by government. In general, Americans who otherwise may question government involvement in private matters expect the government to protect public health and the environment. Highlights of the three true/false questions generally answered incorrectly demonstrate this reliance by the public.

-Industrial and household chemicals are routinely tested and approved for safe use by the U.S. Environmental Protection Agency or other federal agency

Two out of three Americans (65%) assume this statement is true even though it is not. Only 27% gave the correct response and 8% did not know. Those who live in the West have a clearer grasp of this fact, although 57% (still a strong majority) make the incorrect assumption.

-Tap water is routinely tested and filtered to remove contamination from livestock and pesticide run-off

A significant majority of Americans (59%) thinks this statement is true. However, water utilities do not routinely test for these two forms of water pollution. Moreover, most water treatment systems cannot filter out these pollutants due to dated technology. Indeed, most of the water plant filtering systems in use in America today are unable to screen out chemicals and such chlorine-resistant micro-organisms as Cryptosporidium and Giardia. The testing of drinking water certainly takes place on a regular basis and water utilities are diligent in trying to provide safe and pure water to the public. But, there are certain pollutants that routinely get through the treatment systems and a majority of the public does not recognize this fact.

-No government agency tests bottled water for safety and purity

More than half of Americans (51%) believe this statement to be false. They think (incorrectly) that bottled water is tested for safety and purity. Just 42% of Americans know it is not tested. This misapprehension is ironic because the survey research indicates that many people turn to bottled water because of a lack of faith in the purity of tap water.

Overall, these true/false statements and the public's response to them indicate high levels of faith in the government's protection of public health and safety, even when such faith is largely unfounded. Perhaps one of the most pervasive environmental myths of this decade is the notion that people are being protected when they are not.

Part Two

Continued Support for Government's Role in Protecting the Environment

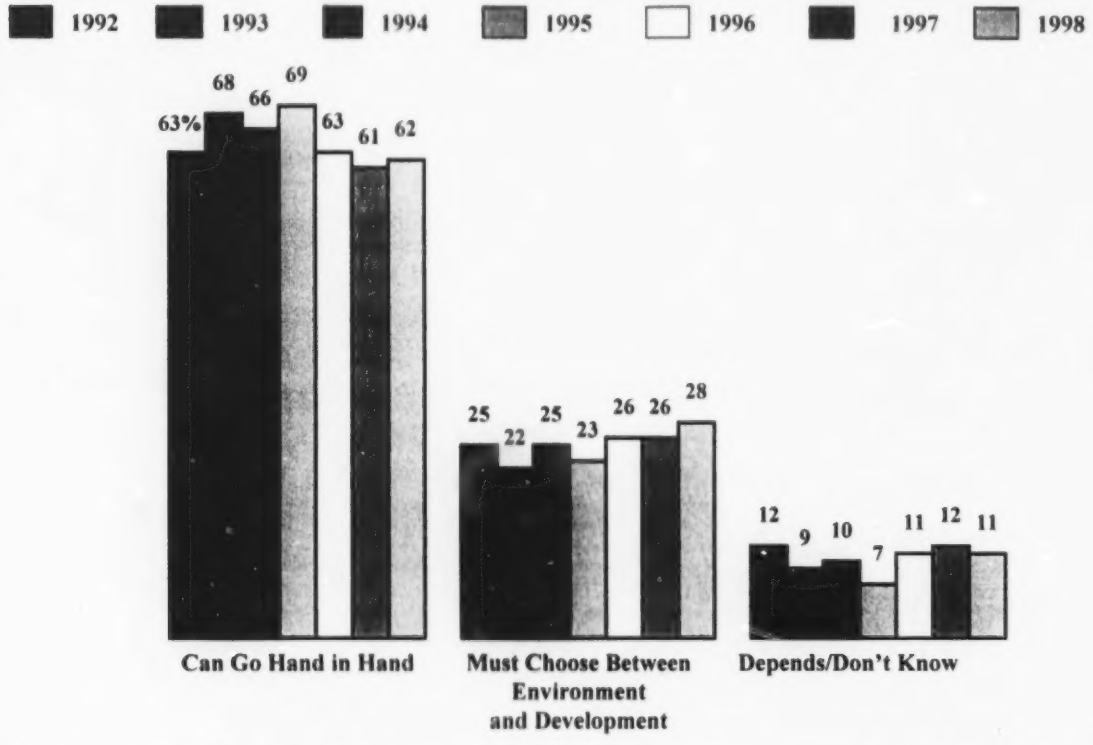
Part II. Support for Government's Role in Protecting the Environment

Americans generally express a desire for the government to play an active role in protecting the environment. Support for environmental protection over economic development is at an all-time high in the seven years of the study. In general though, attitudes toward environmental protection laws are unchanged, while environmental protection laws for two of five specific areas (protecting endangered species and protecting wetlands) register a decrease in the percentage believing the laws go too far.

A Consensus Maintained: Environmental Protection and Economic Development Can Work Together

Can environmental protection and economic development go hand in hand? This important question about the relationship between the environment and the economy has been asked of the American public each of the seven years of this study. As in the previous six years, Americans in 1998 firmly believe that protecting the environment and developing the economy can go hand in hand. Of those surveyed, 62% agree with this option, rather than the alternative—one must be chosen over the other (28%).

Figure 11: Environmental Protection and Economic Development Can Go Hand in Hand



Question wording: Most of the time, do you think environmental protection and economic development can go hand in hand, or that we must choose between environmental protection and economic development?

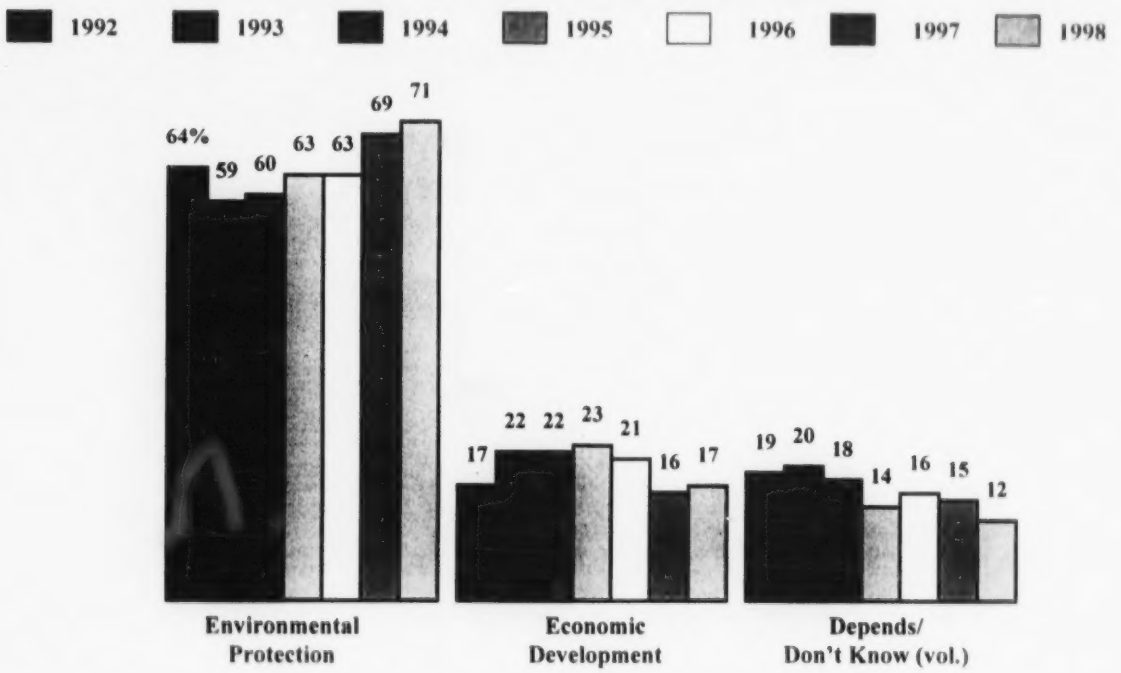
These responses are fairly consistent among demographic subgroups, varying only by education level—60% of Americans with a high school education or less opt for the hand in hand option, compared to 65% of those with a college degree. Women are slightly more likely than men to say that environmental protection and economic development can go together.

When Forced to Choose, Americans Prefer Environmental Protection to Economic Development

Further investigation shows that people's sentiments clearly lie with protecting the environment. People were asked whether, in the case of a forced choice between the two, they would choose environmental protection or economic development.

Even more than in the past, Americans choose to protect the environment when a compromise is impossible. Fully, 71% give this response, while just 17% opt for economic development. The percentage saying they would prefer environmental protection is at an all-time high—up eight points since 1996 and up twelve points from the low seen in 1993 (59%).

Figure 12: When Compromise is Impossible, Environment Favored Over Development



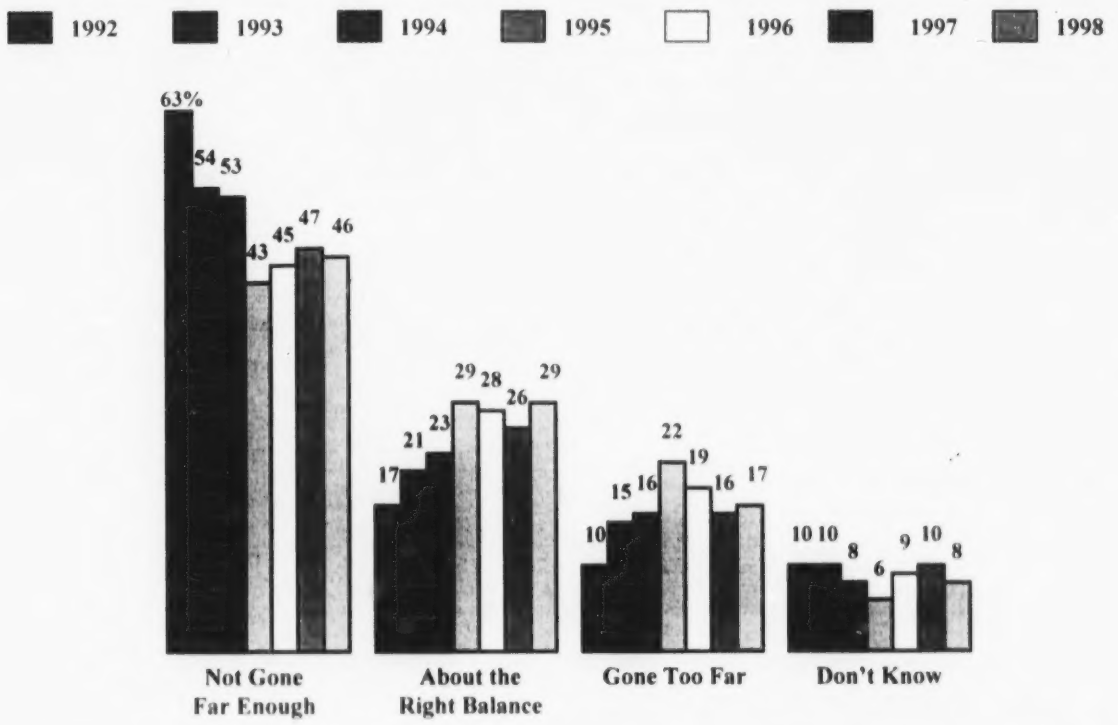
Question wording: When it is impossible to find a reasonable compromise between economic development and environmental protection, which do you usually believe is more important: economic development or environmental protection?

There are important differences among several demographic subgroups. For example, women are considerably more likely than men to opt for protecting the environment (74% versus 68%). Also, whereas environmental protection is the choice for 77% of Americans age 18-34, this falls to 69% of those age 35-44 and to 66% of those age 65 and over. As education level increases, though, preference for the environmental protection option decreases, from 73% among those Americans with a high school education or less to 67% among those who are college graduates.

Many Americans Continue to Feel Environmental Regulations Do Not Go Far Enough

As long as there have been laws protecting the environment, there have been discussions about the extent and impact of the laws. When this survey was first conducted in 1992, 63% said that environmental laws and regulations did not go far enough. After a large decline in the mid-1990s, the percentage holding this opinion has remained steady for the past four years, holding at a few percentage points below 50%. Though lower over time, the "not gone far enough" position remains the most popular, cited by 46% in 1998. This figure compares to the 29% who say that current laws have struck "about the right balance," and just 17% who would argue that current regulations "go too far."

Figure 13: Opinion of Environmental Laws and Regulations



Question wording: There are differing opinions about how far we've gone with environmental protection laws and regulations. At the present time, do you think environmental protection laws and regulations have gone too far, not far enough, or have struck about the right balance?

Gender and age are again keys to understanding attitudes on this issue, as they were in previous NEETF/Roper studies. While women are significantly more likely than men to say that current laws and regulations do not go far enough, men are more likely to state that current laws go too far or have struck about the right balance. With regard to age, the percentage saying that laws for protecting the environment do not go far enough decreases from 55% among 18-34 year olds to 36% among those age 65 and over. At the same time, the percentage holding the "gone too far" viewpoint increases from 11% among 18-34 year olds to 25% of those age 65 and over. Clearly, there are gender and generation gaps in attitudes toward environmental laws and regulations.

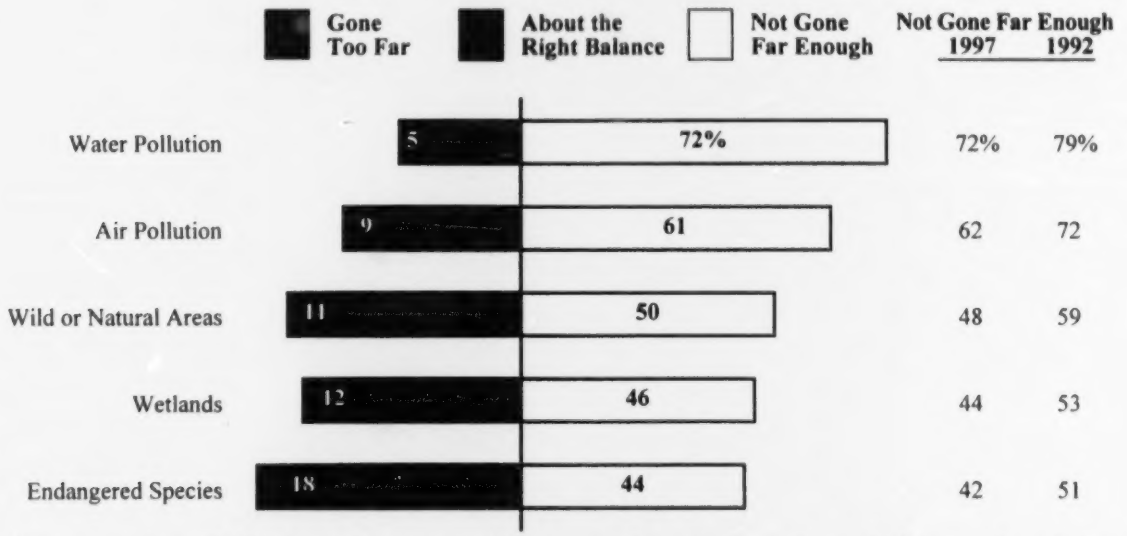
Figure 14: Attitudes Toward Environmental Laws by Gender and Age

Extent of current Environmental Laws		Gender		Age			
	Total	Men	Women	18-34	35-44	45-64	65+
	%	%	%	%	%	%	%
Gone too far	17	21	13	11	15	21	25
Not far enough	46	41	51	55	46	41	36
Struck about the right balance	29	32	27	29	33	29	26
Don't know	8	6	9	5	7	9	12

When asked to consider laws for the protection of five specific parts of the natural environment, Americans clearly rank two as more important than the others—water and air. (Water quality has already been shown to be a concern for many Americans.) Whereas 46% state that environmental laws overall have not gone far enough, 72% say that environmental laws and regulations to prevent water pollution have not gone far enough, and 61% hold the same opinion of laws to prevent air pollution. However, for the other three issues, protection of wild or natural areas, protection of wetlands and endangered species, no more than 50% agree that current laws do not go far enough.

Still, in all five cases, more Americans continue to say that current laws do not go far enough than say that the laws go too far or have struck the right balance. In addition, Americans have largely settled into their positions on these issues, as attitudes toward regulations to protect these five areas of the environment have remained steady since 1995.

Figure 15: Current Regulation of Specific Environmental Issues



Question wording: Thinking now about some specific areas, at the present time, do you think laws and regulations for (INSERT ISSUE FROM ABOVE) have gone too far, not far enough, or have struck about the right balance?

As might be expected, there are large differences within the gender and age subgroups. For each of the five issues, women opt for the "not gone far enough" option more often than men. As with environmental laws overall, men are more likely than women to say regulations go too far, especially for endangered species, wetlands and air pollution.

The generation gap is in evidence when it comes to attitudes toward specific environmental laws and regulations. Americans age 18-34 are consistently more likely than those older than 34 to say current laws for the five specific environmental issues do not go far enough, while those 65 and over are consistently the most likely to say current laws go too far.

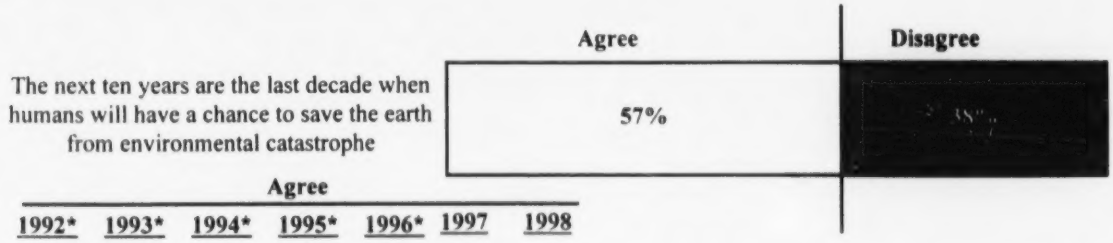
In addition, Westerners are significantly more likely than residents of other parts of the country to state that current laws protecting endangered species of plants, animals and insects go too far, perhaps a reflection of laws concerning the spotted owl, river trout, or the stands of redwoods. Over one-quarter of Westerners (28%) are of this opinion, compared to 18% of those in the South, 14% of those in the Midwest and 12% of those in the Northeast.

Interestingly, endangered species seems to be a "hot button" for those who dislike current environmental regulations. For example, 18% of all Americans say that laws protecting endangered species go too far. Among those who think environmental laws in general go too far, however, fully 51% think regulations protecting endangered species go too far, for a difference of 33 percentage points. By way of comparison, those who think environmental regulations in general go too far are 24 points more likely than the national average to think that laws protecting wetlands go too far; 24 points more likely to have this opinion of laws protecting wild or natural areas; 21 points more likely to feel that laws which fight air pollution go too far; and 12 points more likely to believe water protection laws go too far. Laws for the protection of endangered species are the key point of contention for those Americans who think current environmental regulations go too far.

Clouds on the Horizon: Environmental Catastrophe Ahead

While most Americans do not go to sleep expecting to wake up to an environmentally decimated planet, many feel that something needs to be done soon. This attitude is reflected in the fact that a majority of Americans (57%) agree with the following statement: "The next 10 years are the last decade when humans will have a chance to save the earth from environmental catastrophe." This attitude is unchanged from 1997—evidence that concern about the earth's environmental future continues. The 1998 figure is ten percentage points higher than the 1995 figure of 47%.

Figure 16: Environmental Catastrophe Imminent


Agree
Disagree
The next ten years are the last decade when humans will have a chance to save the earth from environmental catastrophe
57%

Agree						
1992*	1993*	1994*	1995*	1996*	1997	1998
49%	51%	52%	47%	48%	59%	57%

Question wording: Please tell me whether you strongly agree, mostly agree, mostly disagree, or strongly disagree with the following statement...

* *Prior to 1997, statement was asked as "The 1990's is the last decade when humans will have a chance to save the earth from the environmental catastrophe."*

Once again, there are differences by gender and age. Women are 7 percentage points more likely than men to agree with the statement, that is, to agree that environmental catastrophe could occur in the next ten years if something is not done to protect the planet. There is a noticeable difference in opinion among those under and over the age of 45: 61% of Americans age 18-44 agree with the statement, compared to 53% of Americans age 45 and over. The source of this difference is unclear, though it may be related to educational attainment. Disagreement with this phrase increases from 36% among those with a high school education or less, to 39% of those with some college, to 42% of those with at least a college degree, perhaps indicating a skepticism is developed by higher levels of educational attainment.

There are also differences depending on general attitudes toward environmental regulations. The survey shows that among those who believe current laws and regulations protecting the environment strike the right balance, 55 % also agree that humankind must act to save the earth. This figure rises to 68% for those who think current laws do not go far enough, and falls to 39% among those who say current laws go too far. In other words, as concern about the environment increases (reflected in the desire for current environmental laws to go further), so does the belief that mankind must act (pass laws) to prevent environmental catastrophe.

How Parents See Environmental Issues

The *1998 NEETF/Roper Survey* provides an opportunity to look at the attitudes and interests of parents in America and compare them to adults without children. The survey reveals some significant differences between the environmental attitudes of these two groups. These differences may reflect parents' role as caretakers of their children.

When asked whether they would choose the environment or the economy, if such a choice had to be made, parents (74%) are somewhat more likely to say they would choose the environment than are adults without children (69%). When asked if they think government regulation of the environment has gone too far or not far enough, parents view regulation of air and water pollution more favorably than do other adults: 76% of parents as compared to 70% of other adults think water pollution regulation has not gone far enough; and 64% of parents versus 58% of non-parents think that air pollution regulation has not gone far enough.

On both issues it seems that parents might be more attuned to the overall health of their families and so would be more mindful of threats to family health such as water and air pollution. This "health connection" seems to be supported when one notes that similar differences between parents and non-parents are not evident on the subjects of regulation of wild and natural areas, endangered species and wetlands.

For a second straight year there was no evidence that parents have higher levels of environmental knowledge than other adults. This is important to note because it is the prevailing view of the public, as well as the professional field of environmental education, that children learn about the environment in schools and then impart their new-found knowledge to their parents.

The Impact of a Higher Level of Knowledge on Environmental Attitudes

The *1997 NEETF/Roper Survey* presented adult Americans with a basic quiz on environmental knowledge to see if they have an understanding of environmental subjects and issues. The results of this quiz revealed that only about one third of Americans (32%) have a passing knowledge of the environment. The 1997 survey also revealed a strong relationship between higher levels of knowledge and views on environmental regulation. It should be noted that higher levels of knowledge also correspond somewhat to higher income and education levels.

As noted earlier, the *1998 NEETF/Roper Survey* looks at prevailing environmental myths to determine their persistence and whether they are actually preventing individuals from learning accurate information about current environmental problems. Because the average mean response on the 1998 NEETF/Roper myths quiz was 2.2 correct answers (out of ten questions), the public was split into two groups: a low-knowledge group at three or fewer correct responses (74%); and a high-knowledge group of four or more correct responses (26%). Each group's responses were then compared on key questions as follows:

-Can the environment and the economy go hand in hand?

There was little difference between the high-knowledge group (65%) and low-knowledge group (62%), as the majority of both groups believe a balance can be found between the environment and the economy.

-If you must choose would you pick the environment or the economy?

Fully, 73% of the low-knowledge group would pick the environment over the economy as opposed to 66% of the high-knowledge group. One should note that other characteristics of the high-knowledge group, such as higher education levels and higher income levels, also correlate to less support for the environment.

-Has environmental regulation gone too far, not far enough or has it achieved the right balance?

For the most part, there is no real statistical difference between the high-knowledge and low-knowledge groups on their opinions of whether overall environmental regulation has gone too far (low group, 17% and high group, 15%) or whether it has not gone far enough (low group, 45% and high group, 43%). The most telling difference between the groups is those who say that the right balance has been achieved. While 29% of the low-knowledge group thinks there is balance, 35% of the high-knowledge group sees regulation as having achieved balance.

-Air pollution regulation

The low-knowledge group is five percentage points (61%) more likely than the high-knowledge group (56%) to think that regulation of air pollution has not gone far enough, and 11 percentage points less likely (24% versus 35%) to think that balance respecting air pollution regulation has been achieved.

-Regulation of wetlands and wild or natural areas

There is no statistical difference between the high-knowledge and low-knowledge groups respecting the regulation of wetlands and wild and natural areas.

-Regulation of endangered species

There are considerable differences between the high and low-knowledge groups when it comes to endangered species programs. Whereas 15% of the low-knowledge group feel endangered species regulation has gone too far, 23% of the high-knowledge group hold this belief. Correspondingly, 47% of the low-knowledge group feel that endangered species regulation should go further, as opposed to 40% of the high-knowledge group.

-Water pollution regulation

Of those surveyed, 73% of the low-knowledge group think that water pollution regulation should go further compared to 63% of the high-knowledge group. In addition, 18% of the low-knowledge group and 30% of the high-knowledge group feel that the right balance in water pollution regulation has been achieved.

-Environmental Catastrophe on the Horizon?

When asked whether the next ten years is our last chance to avoid a major environmental catastrophe, 59% of the low-knowledge group agreed, 47% of the high-knowledge group agreed. Conversely, 35% of the low-knowledge group disagreed with the statement, while 50% of the high-knowledge group disagreed.

The Environmental Gender Gap—1998

In past *National Report Cards*, as well as the 1998 survey, a notable difference between the environmental attitudes of men and women has repeatedly surfaced. While a large majority of all Americans (71%) favor the environment over the economy, if a choice between them must be made, fully 74% of women favor the environment compared to 68% of men. This stronger pro-environment feeling of women in America is evident from the responses they give to many questions in *The 1998 National Report Card.* For example, 21% of men think environmental regulation has gone too far while just 13% of women feel that way. Conversely, a majority (51%) of women feel that regulation should go further while a 41% plurality of men hold that belief.

Moreover, there is an 11 point difference between men and women (55% versus 66%) on whether government regulation and programs to fight air pollution should go further. Similarly, 76% of women feel that the regulation of water pollution needs to go further as compared to 69% of men. There are similar gender-based point spreads for regulations of wild areas, wetlands and endangered species.

Women are also somewhat more inclined than men to worry about our environmental future. A majority of women (61%) agree that the next ten years is our last chance to avoid a major environmental catastrophe while just 53% of men hold that opinion.

Both men and women consistently support environmental protection programs, but for the seventh straight year of the *NEETF/Roper Survey*, the pro-environment feelings of American women remain stronger than those of men.

A portion of *The 1998 National Report Card* also looks at the frequency with which Americans engage in certain environmental activities on their own (see Part Three). These range from such individual activities as decreasing the amount of chemicals used in lawn care to volunteering for local environmental groups. Generally there are few differences between the rates of involvement of men and women in these activities.

Those that do exist, however, show that women play a strong economic role in the household. Women are clearly more involved then men with such activities as buying environmentally safe products and cutting down on the waste of water and electricity. With each of these activities women are a few percentage points higher in their rates of involvement. A place where men seem to be more engaged in personal environmental activities is in working on wildlife habitat improvement projects. This may have to do with participation rates in the outdoor recreation activities of hunting and fishing. Men are five times more likely than women to hunt and are two times more likely to be anglers.

The *NEETF/Roper Survey* also assesses environmental knowledge in America. For the second straight year, and despite the more pro-environment position of American women, they appear less knowledgeable than men about the environment. The *1997 NEETF/Roper Survey* revealed that 43% of men passed with nine or more correct responses to a 12-question quiz on basic environmental knowledge compared to just 20% of women.

The *1998 NEETF/Roper Survey* looks at how Americans would respond when asked questions on subjects imbued with prevailing environmental myths. The 1998 myths quiz (quite different from the more general 1997 quiz) shows the power that certain environmental myths have in America. Indeed, the mean number of correct responses to the ten myth questions was just 2.2. Therefore, in order to separate out a high-knowledge group from the universe of respondents the dividing line is three or fewer correct answers versus four or more correct. Fully, 69% of the higher-knowledge group are men while 31% are women (see Part One).

The exact reasons for this difference are not well understood and require more research. There are, for instance, no significant education level differences between men and women in the survey sample. Discussions with professional educators may provide a clue, however. They think the difference might be accounted for by the two-to-one ratio of men to women in science-based education and employment in America. Many of the environmental issues covered in the *1997 and 1998 NEETF/Roper Surveys* have scientific underpinnings, and the specific knowledge of a scientific subject or professional experience with science may make the difference between a higher or lower score in the quiz.

Part Three

Environmental Activities

Part III. Environmental Activities

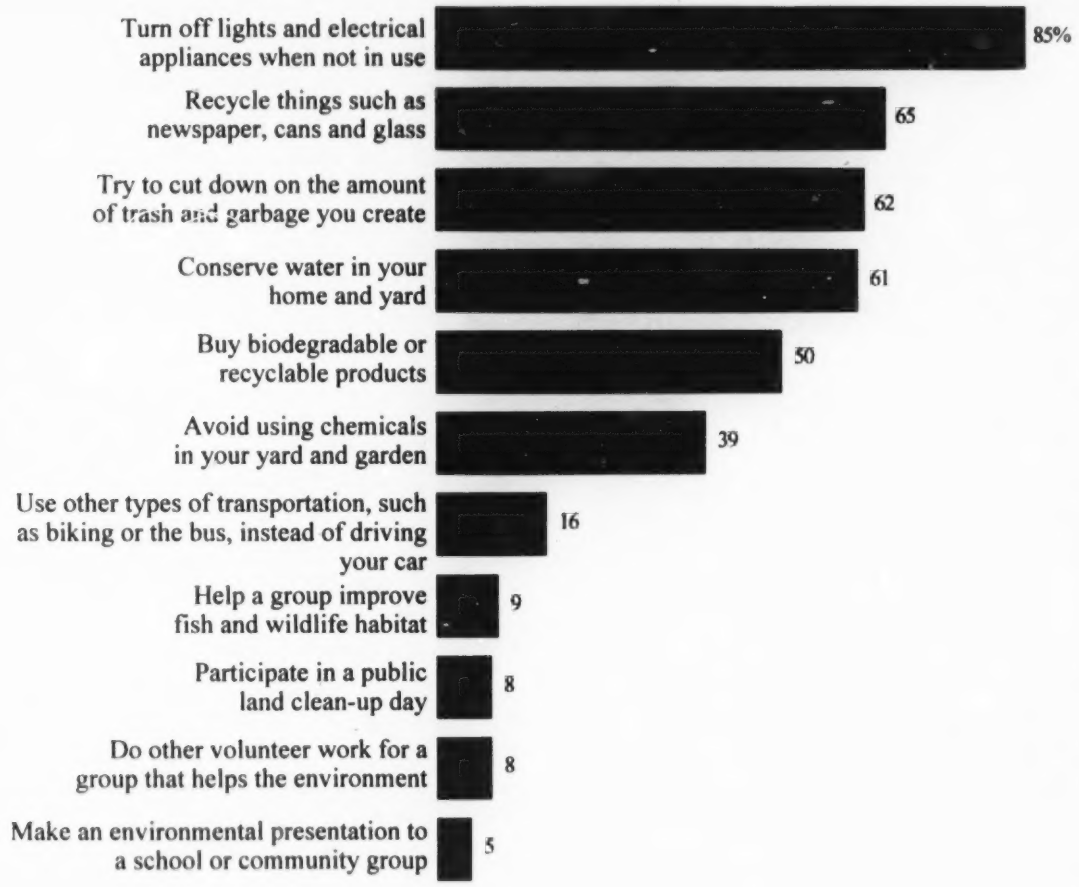
Though they may not realize it, many Americans perform activities each day that benefit the environment in some way. Combined with concerns about and knowledge of the environment, activities that benefit the natural world are the third point in the environment nexus (concern-education-behavior), a model identified and defined in the *1996 and 1997 NEETF/Roper Surveys*.

The Environment in Day-to-Day Life

Whether of their own initiative or compelled into action by laws and regulations, many Americans frequently engage in behaviors that benefit the environment. Asked the frequency with which they do each of eleven activities that benefit the environment, a majority of the public performs four "frequently." One of the most simple behaviors tops the list: 85% report that they frequently turn off lights and electrical appliances when not in use. Whether people consciously do this to benefit the environment or to save money on the electric bill is less important than the fact that they are performing this activity, which protects the environment by reducing the need for power generation at electric plants that burn oil, coal or wood. About six Americans in ten frequently perform three other activities that actually benefit the environment: 65% say they recycle newspapers, cans and glass; 62% say they try to cut down on the amount of trash their households create; and 61% say they conserve water in their homes and yards.

It should be noted that the activities performed most frequently have two things in common. First, they can be done easily at home. Second, they are not necessarily linked with the environment. In fact, fewer than one American in ten says he or she frequently performs the four listed activities that directly state their impact on the environment.

Figure 17: Environmental Activities Done Frequently in Day-to-Day Life


Turn off lights and electrical appliances when not in use
85%
Recycle things such as newspaper, cans and glass
65
Try to cut down on the amount of trash and garbage you create
62
Conserve water in your home and yard
61
Buy biodegradable or recyclable products
50
Avoid using chemicals in your yard and garden
39
Use other types of transportation, such as biking or the bus, instead of driving your car
16
Help a group improve fish and wildlife habitat
9
Participate in a public land clean-up day
8
Do other volunteer work for a group that helps the environment
8
Make an environmental presentation to a school or community group
5

Question wording: Now I would like to ask you about some of the things you may do in your day-to-day life. For each of the following things, would you please tell me whether you never do it, sometimes do it, or frequently do it. (First/Next)...(Ask about each)

The likelihood of performing several of the listed activities "frequently" varies by gender. Women are more likely than men to say they frequently turn off lights and appliances when leaving a room, try to cut down on trash created, conserve water in the home and yard, buy biodegradable or recyclable products, and avoid using chemicals in the home or garden. Men are more likely than women to say they frequently "help a group improve fish and wildlife habitat."

Figure 18: Environmental Activities Performed Frequently by Gender

	Total	Gender	
		Male	Female
	%	%	%
Turn off lights and electrical appliances when not in use	85	83	87
Recycle things such as newspaper, cans and glass	65	64	67
Try to cut down on the amount of trash and garbage you create	62	58	66
Conserve water in your home and yard	61	58	64
Buy biodegradable or recyclable products	50	43	57
Avoid using chemicals in your yard and garden	39	35	42
Use other types of transportation, such as biking or the bus, instead of driving your car	16	16	17
Help a group improve fish and wildlife habitat	9	13	6
Participate in a public land clean-up day	8	7	8
Do other volunteer work for a group that helps the environment	8	9	7
Make an environmental presentation to a school or community group	5	5	5

Interestingly, only one activity varies significantly by region. Perhaps due to different laws in different areas, "frequent" recycling of newspapers, cans and glass is highest in the Northeast (82%) and lowest in the South (55%), with the West (72%) and Midwest (62%) closer to the national average.

In an effort to reduce the bias that may be associated with performing the activities directly linked to the environment, those who perform each activity "sometimes" were combined with those who do each activity "frequently" to establish an "ever perform" figure. Thus, over four Americans in ten say that they participate in a public land clean-up day, while just over a third say they do other volunteer work for groups that help the environment. In other words, though they may not *frequently* engage in these activities, many Americans do find some time to do work that benefits the environment.

Figure 19: Frequency of Environmental Activities Performed

	How Often Perform Activity			
	Frequently	Sometimes	Ever Perform	Never Perform
	%	%	%	%
Participate in a public land clean-up day	8	34	42	58
Do other volunteer work for a group that helps the environment	8	28	36	64
Help a group improve fish and wildlife habitat	9	20	29	70
Make an environmental presentation to a school or community group	5	12	17	82

As seen in the 1996 and 1997 NEETF/Roper studies, a relationship exists between environmental concerns, knowledge and behaviors. A schematic of this relationship would look something like this:

Concern → **Education**

↖ ↙

Behavior

Americans' deep concern for the environment is reflected in the plurality of those surveyed who think current environmental regulations do not go far enough and the majority who think the next ten years are the last decade to save the planet from environmental catastrophe. The survey also shows that Americans tend to believe environmental myths rather than truths. Furthermore, even those who say they have "a lot" or "a fair amount" of environmental knowledge believe inaccurate information.

Still, as seen in the table on the next page, there is often a relationship between knowledge and behavior. For nine of the eleven activities that benefit the environment, the likelihood that people perform those activities frequently increases proportionately with their self–reported environmental knowledge. The only exceptions are the turning off of lights and appliances (which nearly everyone does) and the use of alternative forms of transportation (which may depend more on regional infrastructure and availability than concern about the environment).

Figure 20: Activities Done Frequently in Day-to-Day Life that Benefit the Environment by Self-Reported Environmental Knowledge

		Self-Reported Environmental Knowledge		
	Total	A lot	A fair amount	Little/Practically Nothing
	%	%	%	%
Turn off lights and electrical appliances when not in use	85	82	87	82
Recycle newspaper, cans and glass	65	74	69	56
Try to cut down on the amount of trash and garbage you create	62	68	63	59
Conserve water in your home and yard	61	71	62	56
Buy biodegradable or recyclable products	50	58	55	40
Avoid using chemicals in yard and garden	39	50	39	34
Use other types of transportation; biking or the bus, instead of driving your car	16	16	18	14
Help a group improve fish and wildlife habitat	9	23	8	7
Participate in a public land clean-up day	8	14	7	6
Do other volunteer work for a group that helps the environment	8	19	7	4
Make an environmental presentation to a school or community group	5	11	4	5

Clearly, concern about and knowledge of the environment do have an effect on the likelihood of engaging in day-to-day activities that directly or indirectly benefit the environment. According to the figures discussed earlier, increasing environmental knowledge for all Americans should increase individual involvement in environmental affairs. Therefore, education about the environment is required if Americans are to 1) understand how their decisions affect the environment, 2) be able to communicate their attitudes toward the environment to others (such as their firm belief in a balance between environmental protection and economic development) and 3) become more involved in environmental activities.

An Environmental Education Agenda: Recommendations

The National Environmental Education & Training Foundation is a leading source of information and programs concerning environmental education in America. The following recommendations are a compendium of "lessons learned" from several years of *National Report Card* data and experience gained from other sources.

Educators and policymakers should be very clear on where old news and persistent environmental myths are clouding the public's understanding of the most pressing environmental problems.

The *1998 NEETF/Roper Survey* makes it clear that there are a number of persistent environmental myths around current environmental problems that are diverting public attention and discussions from some of the leading environmental problems facing us today. Examples of these inaccurate beliefs exist around water quality issues, air quality issues, wildlife preservation and more. Efforts to make the public more aware of the primary problems may need to correspond with an active effort to place some of these myths in a more accurate perspective.

We must make sure that professionals in the environmental field do not assume the public knows more than it really does about environmental issues.

NEETF is concerned about a tendency of those working in the field of the environment—companies, government and non-governmental organizations—to assume that average Americans know more than they do about the environment. Any technical field has this problem. But, the environmental community's long-term goal of environmental literacy for all Americans demands that there be a good assessment of public knowledge.

Professionals in the environmental field should guard against using technical language and professional jargon when communicating with the public.

The environmental field has its own language and way of describing its goals and activities. This language can be quite technical and fairly internal to the field. Because this same field has a goal of seeing the public well educated on the environment, it is important that environmental educators use everyday language in communicating with the public.

As environmental issues and their solutions become more complex, there must be greater use of visual presentations of issues and approaches.

Complex interrelationships in ecosystems, biotechnology, global warming, hydrologic cycles and other issues are difficult to describe using words alone. The 1997 and 1998 *National Report Card* data reveal that the greatest gaps in public understanding of the environment are related to the more complex subjects which do lend themselves to effective graphic presentation.

Educators and policy makers need to better recognize the relationship between scientific knowledge and basic environmental literacy.

The *1997 NEETF/Roper Survey* revealed that only 40% of American men and 20% of American women passed a basic test on environmental knowledge. Because education levels of men and women in the survey were the same, the difference could lie in the amount of science education men and women receive. More research needs to be done on this subject. Recent studies have shown that higher education in science occurs on a two to one basis of men to women in America today. There is a reasonable likelihood that increased emphasis on science education would go far to increase environmental literacy.

We must educate members of the media more effectively on environmental issues.

There are numerous indications in the *National Report Card* data over the years that the media plays a critical role in informing the public about the environment. There may be a particular need to place more emphasis on educating members of the public media on complex environmental issues and approaches.

Because public environmental discussions—in legislation, the courts and the media—tend to become polarized, we need to emphasize the importance of the "innovative middle ground."

Policy makers, legislators, agency representatives and others are often diverted from "win-win" approaches to environmental issues because environmental debates can so quickly become polarized and contentious. These individuals need to be encouraged to seek effective middle ground solutions and not become entrenched in a polarized debate.

Conclusion

Overall, America's report card on environmental knowledge is not good. Designed in part to highlight some of the myths surrounding environmental issues and problems, the *1998 NEETF/Roper Survey* demonstrates the power of myth in the context of the environment. What may be especially alarming is the widespread and persistent nature of the misinformation among most demographic subgroups. Clearly, there is a need to provide environmental information in a form that the American public can more easily remember and internalize. Once the public understands what it is hearing and knows why it is important, environmental myths will begin to disappear. The responsibility for moving in the direction of greater information and understanding rests with public agencies, non-governmental organizations, the environmental community and the media.

However, belief in environmental myths is by no means an indication of apathy toward the environment. In fact, Americans are concerned about the environment. Three-quarters of the American public express concern about the quality and safety of their tap water; a majority think the next 10 years are the last decade to save the planet from environmental catastrophe; and a plurality think current environmental regulations do not go far enough. Moreover, the percentage of Americans who would choose environmental protection over economic development, if a choice was necessary, is at its highest point in the seven years of this study. Americans are concerned about the environment and generally want the government to be actively involved in its protection.

Not only do laws and regulations provide information and change attitudes, they also affect behavior. However, changing behavior is more difficult than changing attitudes. Laws requiring recycling make people think twice before disposing of a newspaper or plastic container (even if they are not aware of the ultimate reason for doing so). Currently, though, Americans are more likely to engage in activities that indirectly benefit the environment—such as turning off lights or recycling—than to take direct action that helps the environment—such as participating in a public land clean up day. It may be that the nature of the activity, passive or active, determines how often people engage in it, rather than its environmental impact.

Fortunately, there is a direct relationship between environmental knowledge and the frequency of participating in activities that benefit the environment. Americans who say they know a lot about the environment (even if some of their information is erroneous) are consistently more likely than those who report less environmental knowledge to frequently perform activities that benefit the environment. Still, those with a lot of environmental knowledge continue to be a minority of the American public. Therefore, large shifts in behavior won't be evident until everyone becomes more knowledgeable about the environment and realizes that his or her own actions are often part of the problem, but could just as easily be part of the solution.

Methodology

Description of the Sample

A nationwide cross-section of 2,004 adults, 18 years of age and older, was interviewed *in The National Environmental Education & Training Foundation Environmental Attitudes and Knowledge Survey*. Interviews were conducted by telephone from April 29 to May 17, 1998. Results are projectable to the total adult population of the continental United States who would be willing to be interviewed in a telephone study of this kind.

The margin of error due to sampling is plus or minus two percentage points at the .95 confidence level, although it is larger for the results for smaller subgroups of the public. For example, the sampling error is plus or minus four percentage points for results among the 667 adults in the sample aged 18-34. The myths section was included in half of the sample (1,000 interviews) and a separate section on "drinking water" was administered to 1,000 interviews (not contained in this report). Previous versions of this study (known as the *Times Mirror Magazines National Environmental Forum* from 1992 to 1995) had a plus or minus three percentage point margin of sampling error.

Sampling Method

The basic sample was drawn at random from the adult population of the continental United States, excluding institutionalized segments of the public (such as those in Army camps, nursing homes, and prisons).

Households contacted for the survey were selected at random by a procedure known as random digit dialing, which ensures that households with unlisted telephone numbers, as well as those with listed numbers, are included in the sample.

All interviews were conducted during evening hours on weekdays and all day on weekends to ensure that both working as well as non-working segments of the population would be included.

Weighting Procedure

The demographic characteristics of the random sample were compared with the most recent Census Bureau estimates and corrective weights were applied to ensure proper representation based on age, sex and educational attainment.

Percentages Not Totaling 100%

Responses were computerized and rounded off to the nearest whole percentage. As a result, percentages in certain charts and columns may sometimes total slightly more or less than 100%. Also, in certain charts and analyses, the results of those who said "don't know" or chose not to answer may have been omitted.

Spacing/Layout

By slightly modifying spacing, font and point size throughout the document we were able to reduce the number of pages of paper needed to produce this report. These minor formatting changes represent nearly a 10% reduction in document length.

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Appendix

Figure A: Seven Year Trend: A Summary of Changes and Attitudes Over Time

	Total Public 1992 %	Total Public 1998 %
Changed Over the Last Five Years:		
Environmental Laws and Regulations:		
Not Gone Far Enough	63	46
Struck the Right Balance	17	29
Gone Too Far	10	17
Environmental Laws and Regulations: Not Gone Far Enough, For:		
Water Pollution	79	72
Air Pollution	72	61
Wild and Natural Areas	59	50
Wetlands	53	46
Endangered Species	51	44
If No Compromise is Possible:		
Favor Economic Development	17	17
Favor Environmental Protection	64	71
Stayed Statistically the Same Over the Last Five Years:		
Environmental Protection and Economic Development Can Go Hand in Hand	63	62
Must Choose Between the Environment and the Economy	25	28
Agreement with Phrase: The 1990s (or the next ten years) is the last decade when humans will have a chance to save the earth from environmental catastrophe	49	48

Figure B: The Environmental Gender Gap

	Males %	Females %
If No Compromise is Possible Between Environmental Protection and Economic Development:		
Favor economic development	25	17
Favor environmental protection	58	69
Environmental Laws and Regulations:		
Not gone far enough	38	51
Struck the right balance	29	26
Gone too far	23	14
Environmental Laws and Regulations: Not gone far enough, for:		
Water pollution	68	78
Air pollution	58	71
Wild and natural areas	47	53
Wetlands	45	49
Endangered species	39	49
Environmental Knowledge:		
A lot / A fair amount	68	57
Only a little / practically nothing	31	43
Agreement with Phrase: The 1990s (or the next ten years) is the last decade when humans will have a chance to save the earth from environmental catastrophe	46	50

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